

REMARKS/ARGUMENTS

Claims 1-36 are pending. Claims 1, 29, 33, 35, and 36 have been amended. Support for the claim amendments can be found, for example, in FIG. 1 and pages 13-14 of the originally filed specification. No new matter has been added.

I. Claim Rejections – 35 U.S.C. § 101

Claims 35 and 36 were alleged to be directed to non-statutory subject matter. While Applicants respectfully disagree, claims 35 and 36 have been amended to recite, *inter alia*, “[a] computer readable medium having computer executable instructions stored thereon which when executed by at least one processor of an adaptive load balancer cause the processor to process client data access transactions”. The Applicants submit that the amendment further clarifies the invention and overcomes the non-statutory subject matter rejection.

II. Claim Rejections – 35 U.S.C. § 102/103

In the July 3, 2008 Office Action, claims 1-15, 19-20 and 27-36 were rejected under 35 U.S.C. § 102(e) as being anticipated by US 2005/0246393 (“Coates”). Claims 16-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Coates in view of Hundscheidt US 2004/0255016 (“Hundscheidt”). Claim 18 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Coates in view of Quatrano US 6,748,420 (“Quatrano”). Claims 21-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Coates in view of Shima US 2002/0059263 (“Shima”). Claims 23-24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Coates in view of Moshir US 2004/0003266 (“Moshir”). Claim 25 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Coates in view of Manley US 2006/01125151 (“Manley”). Claim 26 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Coates in view of Lees US 2006/0184589 (“Lees”). These rejections are respectfully traversed.

A. Independent Claim 1

Amended independent claim 1 recites, *inter alia*, (i) in an adaptive load balancer, presenting a virtual file system to a client computer system, and (ii) the virtual file system providing access to an aggregated set of files stored by a plurality of server file systems

respectively associated with a plurality of server computer systems, wherein the access to the aggregated set of files is provided through the virtual file system. Coates fails to disclose, teach or suggest at least these features.

Coates discloses a network storage system that “includes a virtual file system (“VFS”) that manages the files of the network storage system, and a storage center that stores the files.” (See Abstract). Coates further discloses that “[t]he VFS and the storage center are separated, such that a client accesses the VFS to conduct file system operations and the client accesses the storage center to upload/download files.” (See Abstract; ¶¶ 54-55) (emphasis added). For example, to download a file in Coates, a client of the network storage system sends a download request to the VFS (e.g., via a storage port over a network) and, in response, receives from the VFS a generated storage resource locator (“SRL”). (See ¶¶ 107, 111-112, 154, 158 and 162; FIGs. 13A-13B). The client then transmits the received SRL to the storage center, via the storage port or through direct communication, and downloads the file, via the storage port or through direct communication. (See ¶¶ 154, 158-159, 162 and 174; FIGs. 4, 19, 23-25). However, the VFS and the storage center in Coates are coupled to communicate information so as to coordinate file system information with the physical storage of the object files, and furthermore, the VFS returns file and folder IDs for the files and subfolders arranged under a subject folder (See ¶¶ 55, 111) (emphasis added). That is, rather than disclosing access to an aggregated set of files provided through a virtual file system, Coates teaches SRLs returned to the client that correspond to files stored at the storage center. In further contrast to the claimed invention, Coates discloses that files can be uploaded or downloaded from the storage center without ever communicating with the VFS such as, for example, if the SRL is found in a directory cache of the storage port. (See ¶ 154; FIG. 23). Accordingly, Coates fails to disclose or suggest a virtual file system providing access to an aggregated set of files stored by a plurality of server file systems, wherein the access to the aggregated set of files is provided through the virtual file system. For at least these reasons, Coates does not disclose or suggest amended independent claim 1.

As discussed above, amended independent claim 1 also recites, *inter alia*, “in an adaptive load balancer, presenting a virtual file system to a client computer system.” (emphasis added). Coates fails to disclose, teach, or suggest this feature, too. Rather, Coates discloses that the

distributed storage cluster (i.e., the storage center) includes a load balancing fabric that is a layer four (“L4”) switch which incorporates load balancing capabilities. (See ¶ 62). As explained above, Coates also discloses that “the VFS and the storage center are separated,” (See Abstract; ¶¶ 54-55). That is, Coates’ load balancer (included within the storage center) is separate from the VFS. For at least this additional reason, Coates does not disclose or suggest amended independent claim 1. Thus, Applicants submit that independent claim 1 is allowable.

B. *Independent Claim 29*

Amended independent claim 29 recites, *inter alia*, (i) in an adaptive load balancer, presenting a virtual file system to a client computer system, and (ii) the virtual file system providing access to an aggregated set of files stored by a plurality of server file systems respectively associated with a plurality of server computer systems, wherein the access to the aggregated set of files is provided through the virtual file system. Coates fails to disclose, teach or suggest at least these features. For at least the reasons discussed above with respect to independent claim 1, amended independent claim 29 is not disclosed or suggested by Coates. Thus, Applicants submit that independent claim 29 is allowable.

C. *Independent Claim 33*

Amended independent claim 33 recites an adaptive load balancer comprising, *inter alia*, (i) presenting a virtual file system to the client computer system via the first communications interface, the virtual file system providing access to an aggregated set of files stored by a plurality of server file systems respectively associated with the plurality of server computer systems, wherein the access to the aggregated set of files is provided through the virtual file system, and (ii) memory encoded with an adaptive transaction application that when performed on the processor, produces an adaptive transaction processor that causes the adaptive load balancer to perform the operations of presenting a virtual file system to the client computer via the first communications interface.” (emphasis added). For at least the reasons discussed above with respect to independent claim 1, amended independent claim 33 is not disclosed or suggested by Coates. Thus, Applicants submit that independent claim 33 is allowable.

D. *Independent Claim 35*

Amended independent claim 35 recites, *inter alia*, (i) in an adaptive load balancer, presenting a virtual file system to a client computer system, and (ii) the virtual file system providing access to an aggregated set of files stored by a plurality of server file systems respectively associated with a plurality of server computer systems, wherein the access to the aggregated set of files is provided through the virtual file system. (emphasis added). Independent claim 35 further recites, *inter alia*, a computer readable medium having computer executable instructions stored thereon which when executed by at least one processor of an adaptive load balancer cause the processor to process client data access transactions via operations comprising presenting a virtual data system to a client computer system. For at least the reasons discussed above with respect to independent claim 1, amended independent claim 35 is not disclosed or suggested by Coates. Thus, Applicants submit that independent claim 35 is allowable.

E. *Dependent Claims 2-28, 30-32, 34, and 36*

Claims 2-28, 30-32, 34, and 36 depend either directly or indirectly from one of independent claims 1, 29, 33, and 35. For at least the reasons discussed above for their respective independent claims, Applicants respectfully traverse the rejection of claims 2-28, 30-32, 34, and 36 based on Coates. Thus, Applicants submit that dependent claims 2-28, 30-32, 34, and 36 are further allowable.

In addition, Coates fails to disclose or suggest one or more additional elements of dependent claim 2-28, 30-32, 34, and 36. For example, claim 2 recites, *inter alia*, (i) forwarding the server file access transaction to a selected one of the plurality of server computer systems specified by the metadata associated with the virtual file system, and (ii) receiving a server transaction response from the server computer system to which the server file access transaction was forwarded and translating, using the metadata associated with the virtual file system, the server transaction response into a client file access response. (emphasis added). However, Coates fails to disclose, teach, or suggest these features. Rather, Coates discloses that the object files, stored in one or more storage clusters, are not associated with a “central authority” that specifies a physical location for the object files. The VFS, in part, stores an object fingerprint for a file, but does not indicate a location for the file. (*See* ¶ 77). Because the VFS does not know

the location of a file, an upload or download request is not sent to a particular server specified by any data associated with the VFS. In fact, Coates discloses that the load balancing fabric 310 distributes upload and download requests to one of a plurality of [distributed object storage managers] DOSMs based on DOSM availability. (See ¶ 62) (emphasis added). Furthermore, Coates recites transmitting a requested file directly from the storage cluster (i.e., storage center) to the recipient (i.e., end-user or client). (See ¶¶ 81, 159, 162, and 174). In addition, the Office Action improperly relies on certain portions of Coates as disclosing certain elements of claim 2. For example, ¶ 111 of Coates only discusses responses from the VFS – that is, the citation to Coates fails to disclose or suggest responses from server computer systems, as recited in claim 2. For at least these additional reasons, the evidence relied upon from Coates does not disclose or suggest claim 2.

As another example, claim 3 recites, *inter alia*, maintaining the metadata associated with the virtual file system in at least one forwarding table containing forwarding table entries that provide a mapping of virtual file system parameters to physical file system parameters. (emphasis added). Coates further fails to disclose, teach or suggest at least this feature. As explained above with respect to claim 2, Coates discloses that the object files, stored in one or more storage clusters, are not associated with a “central authority” that specifies a physical location for the object files. The VFS, in part, stores an object fingerprint for a file, but does not indicate a location for the file. (See ¶ 77). For at least this additional reason, Coates does not disclose or suggest claim 3.

As a further example, claim 5 recites, *inter alia*, maintaining an active transaction table that associates client file access transactions to corresponding server file access transactions. The evidence cited from Coates fails to disclose, teach or suggest this feature. In the Office Action, ¶¶ 102-106 of Coates were alleged to disclose an active transaction table as claimed. However, the cited portions of Coates relate to an implementation for structuring a virtual file system as a hierarchical file system of “directories or folders arranged in levels.” (See ¶¶ 101-102). To implement this hierarchical file system, Coates discloses using database tables for storing various fields such as, for example, “folder ID”, “parent folder ID”, “file handle”, and “Customer ID”, which “identifies the customer that owns the file.” (See ¶ 104) (emphasis added). It is noteworthy that Coates does not way disclose, teach or suggest maintaining active

directory or file transactions in these tables. For at least this additional reason, Coates does not disclose or suggest claim 5.

Claim 6 recites, *inter alia*, translating, using the metadata associated with the virtual file system, the server transaction response into a client file access response. Coates fails to disclose, teach or suggest this feature for at least the reasons explained above with respect to claim 2. Further, in the Office Action, ¶¶ 150-154 of Coates were alleged to disclose this claimed feature; however, the alleged portion of Coates relates to translating client requests into server requests. That is, the cited portions of Coates do not relate to server transaction responses from server computer systems. For at least this additional reason, Coates does not disclose or suggest claim 6.

Claim 7 recites, *inter alia*, each directory file mapping table containing a mapping of virtual file identities of files within the virtual file system of that directory to physical file identities of a corresponding file and server computer system. (emphasis added). In the Office Action, ¶¶ 101-104 of Coates were alleged to disclose the claimed feature. As explained above with respect to claim 5, the citations to Coates relate to structuring a virtual file system as a hierarchical file system of “directories or folders arranged in levels” using database tables. (See ¶¶ 101-102). One field included in the database tables of the VFS is a file handle field. The file handle field stores the fingerprint that the network file system uses to uniquely identify the file. (See ¶ 104). However, as explained above with respect to claims 2 and 3, the VFS, in part, stores an object fingerprint for a file, but does not indicate a location for the file. (See ¶ 77). Accordingly, Coates fails to disclose, teach or suggest each directory file mapping table containing a mapping of virtual file identities of files within the virtual file system of that directory to physical file identities of a corresponding file and server computer system. For at least this additional reason, Coates does not disclose or suggest claim 7.

Claim 12 recites, *inter alia*, in response to detecting the trend of access, performing a migration operation on the file for which the trend is detected in order to manage access to the file. Coates fails to disclose, teach or suggest least this feature. Rather, Coates appears limited to utilizing automatic caching of objects as they are returned to the requester. For example, Coates explains that “based on available resources, the load balancing fabric 310 selects, for two

separate requests, the DOSM 2 and the DOSM 'n' to handle the two requests.” ¶ 118 (emphasis added). Thus, whether a DOSM stores a high demand object is purely a matter of chance that the DOSM is selected by the load balancing fabric to handle a request for a file. That is, Coates does not disclose, teach or suggest detecting a trend or performing a migration operation on a high demand object. For at least this additional reason, Coates does not disclose or suggest claim 12.

Claim 15 recites, *inter alia*, identifying, using metadata associated with the virtual file system, that the file is replicated across a plurality of server file systems of respective server computer systems and in response to identifying that the file is replicated, instructing at least one server computer system that maintains a replicated copy of the file within its server file system to remove the replicated copy. Coates fails to disclose, teach or suggest these features. Rather, Coates disclosure appears limited to “objects [] deleted from the data cache in order to store objects more recently requested via a least recently used (“LRU”) caching policy.” ¶ 116. However, a least recently used caching policy does not identify that a file is replicated across a plurality of server file systems. For at least this additional reason, Coates does not disclose or suggest claim 15.

As a further example, claim 30 recites, *inter alia*, wherein the metadata is information maintained by the adaptive load balancer to map virtual file parameters within file system requests provided from client computer systems for access to information associated with a file presented within the virtual file system to corresponding physical file parameters of an instance of a file in at least one of the server file system maintained by at least one of the server computer systems. (emphasis added). Coates fails to disclose, teach or suggest this feature. As explained above, Coates discloses that “the object files, stored in one or more storage clusters, are not associated with a ‘central authority’ that specifies a physical location for the object files. The VFS, in part, stores an object fingerprint for a file, but does not indicate a location for the file.” ¶ 77. For at least this additional reason, Coates does not disclose or suggest claim 30.

III. Conclusion

It is the Applicants’ belief that claims 1-36 are in condition for allowance and action towards that effect is respectfully requested. If there are any matters which may be resolved or

clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at (312) 425-8552.

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It is believed that no fees are due except for the fees associated with the three-month extension; however, should any additional fees be required (except for payment of the issue fee) or credit be due, the Commissioner is authorized to deduct the fees from or credit the overpayments to the Nixon Peabody Deposit Account No. 50-4181, Order No. 812495-010001.

Respectfully submitted,

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